RECEIVED
CENTRAL FAX CENTER

APR 04 2006

Yee & Associates, P.C.

4100 Alpha Road
Suite 1100
Dallas, Texas 75244

Main No. (972) 385-8777
Facsimile (972) 385-7766

Facsimile Cover Sheet

To: Commissioner for Patents for **Examiner Van H. Nguyen** **Group Art Unit 2194**	Facsimile No.: **571/273-8300**
From: Michele Morrow, Legal Assistant to Francis Lammes	No. of Pages Including Cover Sheet: **25**

Message:

Enclosed herewith:

- Transmittal of Appeal Brief; and
- Appeal Brief.

Re: Application No. **09/965,005**
Attorney Docket No: **AUS920010491US1**

Date: Tuesday, April 04, 2006

Please contact us at (972) 385-8777 if you do not receive all pages indicated above or experience any difficulty in receiving this facsimile.	*This Facsimile is intended only for the use of the addressee and, if the addressee is a client or their agent, contains privileged and confidential information. If you are not the intended recipient of this facsimile, you have received this facsimile inadvertently and in error. Any review, dissemination, distribution, or copying is strictly prohibited. If you received this facsimile in error, please notify us by telephone and return the facsimile to us immediately.*

PLEASE CONFIRM RECEIPT OF THIS TRANSMISSION BY FAXING A CONFIRMATION TO 972-385-7766.

RECEIVED
CENTRAL FAX CENTER
APR 04 2006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Craddock et al.** §
§
Serial No.: **09/965,005** §
§
Filed: **September 27, 2001** §
§
For: **End Node Partitioning Using Virtualization** §
§

Group Art Unit: **2194**

Examiner: **Nguyen, Van H.**

Attorney Docket No.: **AUS920010491US1**

35525
PATENT TRADEMARK OFFICE
CUSTOMER NUMBER

Certificate of Transmission Under 37 C.F.R. § 1.8(a)
I hereby certify this correspondence is being transmitted via facsimile to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, facsimile number (571) 273-8300 on April 4, 2006.

By: Michele Morrow
Michele Morrow

TRANSMITTAL OF APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:
ENCLOSED HEREWITH:

- Appeal Brief (37 C.F.R. 41.37)

A fee of $500.00 is required for filing an Appeal Brief. Please charge this fee to IBM Corporation Deposit Account No. 09-0447. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to IBM Corporation Deposit Account No. 09-0447.

Respectfully submitted,
Francis Lammes
Francis Lammes
Registration No. 55,353
AGENT FOR APPLICANTS

Duke W. Yee
Registration No. 34,285
YEE & ASSOCIATES, P.C.
P.O. Box 802333
Dallas, Texas 75380
(972) 385-8777
ATTORNEY FOR APPLICANTS

RECEIVED
CENTRAL FAX CENTER

APR 04 2006

Docket No. AUS920010491US1 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Craddock et al.**	§	
	§	Group Art Unit: **2194**
Serial No. **09/965,005**	§	
	§	Examiner: **Nguyen, Van H.**
Filed: **September 27, 2001**	§	
	§	
For: **End Node Partitioning Using Virtualization**	§ §	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

35525
PATENT TRADEMARK OFFICE
CUSTOMER NUMBER

<u>Certificate of Transmission Under 37 C.F.R. § 1.8(a)</u>
I hereby certify this correspondence is being transmitted via facsimile to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, facsimile number (571) 273-8300 on April 4, 2006.

By: Michele Morrow
Michele Morrow

APPEAL BRIEF (37 C.F.R. 41.37)

This brief is in furtherance of the Notice of Appeal, filed in this case on February 9, 2006.

A fee of $500.00 is required for filing an Appeal Brief. Please charge this fee to IBM Corporation Deposit Account No. 09-0447. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to IBM Corporation Deposit Account No. 09-0447.

04/05/2006 CCHAU1 00000057 090447 09965005
01 FC:1402 500.00 DA

REAL PARTY IN INTEREST

The real party in interest in this appeal is the following party: International Business Machines Corporation.

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-19.

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: NONE.
2. Claims withdrawn from consideration but not canceled: NONE.
3. Claims pending: 1-19.
4. Claims allowed: NONE.
5. Claims rejected: 1-19.
6. Claims objected to: NONE.

C. CLAIMS ON APPEAL

The claims on appeal are: 1-19.

STATUS OF AMENDMENTS

There are no amendments after the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 1, 11, and 19:

The present invention provides a method for partitioning a computer network end node. (Specification, page 1, lines 409 and page 30, lines 28-30) The present invention virtualizes a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices. (Specification, page 23, lines 1-4) The present invention virtualizes at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router. (Specification, page 23, line 3, to page 26, line 11) Wherein the virtual router of the present invention performs control-flow processing for the virtual network devices. (Specification, page 27, lines 8-25) Wherein the virtual router of the present invention functions of destination lookup and packet forwarding are incurred only on control-flow processing. (Specification, page 26, lines 12-29) Wherein the virtual network devices and the virtual router of the present invention form a virtual subnet. (Specification, page 23, line 5, to page 26, line 11)

The system recited in claim 19 may be a system for partitioning a computer network end node comprised of a first virtualizing component and a second virtualizing component, such as virtual host processor node 602, virtual host processor node 604, virtual host channel adapter (HCA) 606, or virtual host channel adapter (HCA) 608 of Figure 6 performing the steps described in the specification at page 22, line 29, to page 30, line 11 and page 30, lines 12-30, or equivalent. A person having ordinary skill in the art would be able to derive computer instructions on a computer readable medium as recited in claim 11, as well as dependent claims 12-18, given **Figures 6** and 7 and the corresponding description at page 22, line 29, to page 30, line 11 and page 30, lines 12-30, without undue experimentation.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. GROUND OF REJECTION (Claims 1-19)

Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pettey et al. (U.S. Patent No. 6,594,712 B1) in view of Yuasa et al. (U.S. Patent No. 6,085,238).

ARGUMENT

A. 35 U.S.C. § 103, Alleged Obviousness, Claims 1-19

The Examiner rejects claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Pettey et al. (U.S. Patent No. 6,594,712 B1) in view of Yuasa et al. (U.S. Patent No. 6,085,238). This rejection is respectfully traversed.

As to claims 1, 11 and 19, the Examiner states:

> As to claim 1, Pettey teaches the invention substantially as claimed including a method for partitioning a computer network end node (col. 6, lines 14-29), the method comprising:
>
> - virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to from network devices (col.6, lines 20-47 and fig.1); and
>
> - virtualizing at least one router on the multi-function chip by means of a combination of hardware and software to form a router (col.6, lines 22-27 and fig.1), wherein the virtual router performs control-flow processing for the virtual network devices (col. 6, lines 23-38 and figs. 7a-7b);
>
> wherein the virtual network devices and the router form a subnet (col.6, lines 31-38).
>
> Pettey does teach network devices, a router, a subnet, but does not explicitly teach a virtual network devices, a virtual router and a virtual subnet and the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing.
>
> Yuasa teaches a virtual network devices (see the abstract), a virtual router (col.72, lines 14-30, a virtual subnet (col.39, lines 3-14), and the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing (col.39, lines 16-34 and col.72, lines 14-41).
>
> It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Yuasa and Pettey because Yuasa's teaching would have provided the capability of enabling highs peed routing for the intranet. Thus, system costs are drastically decreased and intranet routing performance can be enhanced.

Office Action dated July 14, 2005, pages 4-5.

Claim 1, which is representative of the other rejected independent claims 11, and 19 with regard to similarly recited subject matter, reads as follows:

> 1. A method for partitioning a computer network end node, the method comprising:

virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices; and

virtualizing at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices, and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing;

wherein the virtual network devices and virtual router form a virtual subnet.

Pettey and Yuasa, taken alone or in combination, fail to teach or suggest virtualizing a plurality of network devices **on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices, virtualizing at least one router **on the single multi-function chip** by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices, wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing, and wherein the virtual network devices and virtual router form a virtual subnet.

Pettey is directed to an Infiniband channel adapter for performing direct data transfers between a PCI bus and an Infiniband link without double-buffering the data in system memory. In the Pettey system, a local processor programs the channel adapter to decode addresses in a range of the PCI bus address space dedicated to direct transfers. When an I/O controller attached to the PCI bus transfers data from an I/O device to an address in the dedicated range, the channel adapter receives the data into an internal buffer and creates an Infiniband RDMA Write packet for transmission to virtual address within a remote Infiniband node. When the channel adapter receives an Infiniband RDMA Read Response packet, the channel adapter provides the packet payload data to the I/O controller at a PCI address in the dedicated range.

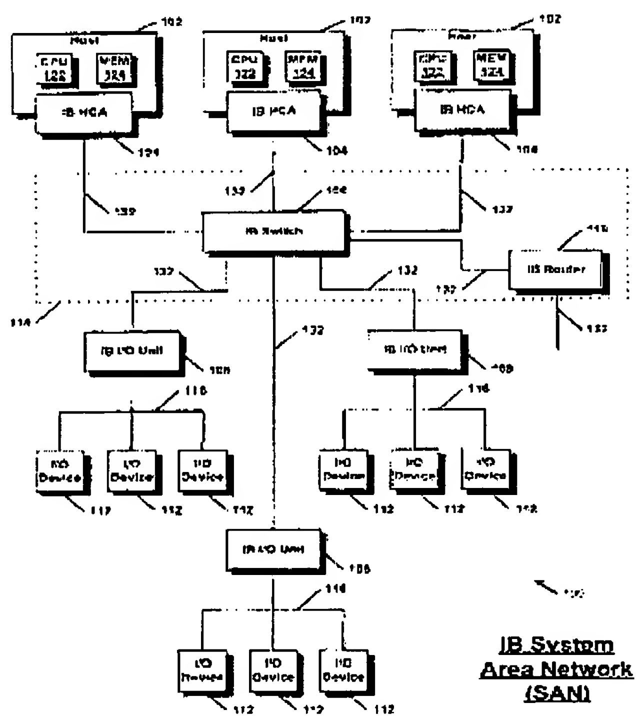
Thus, in the system of Pettey, the Infiniband channel adapter couples to an I/O controller via a local bus interface. The local bus interface receives data from the I/O controller if a local bus address of the data is within a predetermined address range of the local bus address space. The Examiner alleges that Pettey teaches virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices, at column 6, lines 20-47, and Figure 1, which read and are shown as follows:

The hosts 102 are IB processor end nodes, such as server computers, that comprise at least a CPU 122 and memory 124 complex. Each of the hosts 102 includes one or more IB Host Channel Adapters (HCA) 104 for interfacing the hosts 102 to an IB fabric 114. The IB fabric 114 is comprised of one or more IB Switches 106 and IB Routers 118 connected by a plurality of IB serial links 132. For example, an HCA 104 may be coupled to a host 102 via a PCI bus or the HCA 104 may be coupled directly to the memory and/or processor bus of the host 102.

The SAN 100 also includes a plurality of IB I/O units 108 coupled to the IB fabric 114. The IB hosts 102 and IB I/O units 108 are referred to collectively as IB end nodes. The IB end nodes are coupled by the IB switch 106 that connects the various IB links 132 in the IB fabric 114. The collection of end nodes shown comprises an IB subnet. The IB subnet may be coupled to other IB subnets (not shown) by the IB router 118 coupled to the IB switch 106.

Coupled to the I/O units 108 are a plurality of I/O devices 112, such as disk drives, network interface controllers, tape drives, CD-ROM drives, graphics devices, etc. The I/O units 108 may comprise various types of controllers, such as a RAID (Redundant Array of Inexpensive Disks) controller. The I/O devices 112 may be coupled to the I/O units 108 by any of various interfaces, including SCSI (Small Computer System Interface), Fibre-Channel, Ethernet, IEEE 1394, etc.

(Column 6, lines 20-47)



(Figure 1)

In this section and Figure, Pettey describes how the hosts **102** include one or more IB Host Channel Adapters **104** for interfacing the hosts **102** to an IB fabric **114**. The IB fabric **114** is comprised of one or more IB Switches **106** and IB Routers **118** connected by a plurality of IB serial links **132**. Thus the numerous devices are interfaced to each other through the use of an Infiniband fabric **114**. An Infiniband fabric is part of the InfiniBand Architecture (IBA), which is designed around the point-to-point switched I/O fabric whereby each node device is interconnected by cascade switch devices. This architecture specifies an interconnection technology between processor nodes, and I/O nodes in order to form a System Area Network (SAN). IBA SAN consists of the processor nodes (HCAs) and I/O units (TCA) connected through the IBA fabric made up of the cascaded switches and the routers. Thus, the devices, in the system of Pettey, are separate **physical** devices that are **separately** interconnected through the Infiniband fabric and are not a plurality of network devices **virtualized on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices.

In response, the Examiner states:

> As to point (a), it is noted that Petty (*sic, spelled incorrectly throughout*) and the instant application both relate to an InfiniBand System Area Network. Petty teaches virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices (e.g., see fig.1 and the accompanying text beginning at col.6, line 14). As detailed in the rejection above, Petty is silent on "virtual" network devices. Yuasa is combined to teach "virtual" network devices. (*emphasis* added)

(Final Office Action, page 5, section 20)

The allegation of the Examiner contradicts itself. First the Examiner states that "Petty teaches virtualizing a plurality of network devices" and then the Examiner states "Petty is silent on "virtual" network devices." Appellants respectfully submit that not only does Pettey fail to teach or suggest virtual network devices, Pettey's teachings of connecting separate **physical** devices through the Infiniband fabric are not a plurality of network devices virtualized on a **single multi-function chip** by means of a combination of hardware and software to form virtual network devices, as discussed above. Moreover, there is no need presented by Pettey for the physical devices to be virtualized. That is, since the devices are physical devices that are connected via the Infiniband fabric, Pettey does not need to virtualize any device.

Furthermore, Pettey does not teach or suggest virtualizing at least one router **on the single multi-function chip** by means of a combination of hardware and software to form a virtual router. The Examiner alleges that this feature is taught by Pettey at Figure 1 and column 6, lines 22-27, shown above. As discussed above, Pettey teaches an IB fabric that is comprised of Infiniband switches and Infiniband routers connected by a plurality of Infiniband serial links. The switches and routers are **physical** devices that are interconnected through the Infiniband fabric. Neither the switches nor the routers are **virtualized.** Thus, Pettey does not teach **virtualizing** at least one router on **the single multi-function** chip by means of a combination of hardware and software to form a virtual router.

In response, the Examiner states:

> As to point (b), Petty (*sic, spelled incorrectly throughout*) teaches virtualizing at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router (e.g., see fig.1 and the IB router discussion, beginning at col.6, line 22). Again Yuasa is combined to teach a "virtual" router. (*emphasis* added)

(Final Office Action, page 5, section 21)

As stated previously, Appellants respectfully submit that not only does Pettey fail to teach or suggest virtual network devices, Pettey's router is a physical device that is connected through an Infiniband fabric and is not at least one router **on the single multi-function chip** by means of a combination of hardware and software to form a virtual router. Moreover, there is no need presented by Pettey for the physical router to be virtualized. That is, since the router is a physical device that is connected via the Infiniband fabric, Pettey dos not need to virtualize the router.

Additionally, Pettey does not teach or suggest the virtual network devices and virtual router form a virtual subnet. The Examiner alleges that this feature is taught by Pettey at column 6, lines 31-38, shown above. In the cited section, Pettey is merely describing that the physical devices, IB hosts and IB I/O units, connected through the Infiniband fabric are referred to collectively as IB end nodes. The coupling of the IB end nodes by the IB switch comprises an IB subnet. While Pettey may teach a subnet comprised of hosts and switches, the subnet is a physical subnet and not a virtual subnet. Furthermore, the switches and hosts that comprise the subnet of Pettey are physical devices and not virtual network devices and a virtual router.

In response, the Examiner states:

> As to point (c), Petty (*sic, spelled incorrectly throughout*) teaches the virtual network devices and virtual router form a virtual subnet (e.g., see fig.1 and the IB subnet discussion, beginning at col.6, line 31). Again Yuasa is combined to teach a "virtual" subnet.

(Final Office Action, page 6, section 22)

As stated previously, Appellants respectfully submit that not only does Pettey fail to teach or suggest virtual network devices, Pettey's subnet is a physical device that is connected through an Infiniband fabric and is not virtual network devices and a virtual router that form a virtual subnet. Moreover, there is no need presented by Pettey for the physical devices and router to be virtualized and form a virtual subnet. That is, since the devices are physical devices that are connected via the Infiniband fabric, Pettey dos not need to virtualize any device.

Furthermore, Pettey does not teach or suggest the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing. The Examiner admits that Pettey does not teach this feature on page 4, but alleges that Yuasa teaches this feature. Yuasa does not provide for the deficiencies of Pettey and, thus, any alleged combination of Yuasa and Pettey would not be sufficient to reject claims 1, 11, and 19. That is Yuasa does not teach virtualizing a plurality of network devices **on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices, virtualizing at least one router **on the single multi-function chip** by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing, and wherein the virtual network devices and virtual router form a virtual subnet. The Examiner states:

> Yuasa teaches a virtual network devices (see the abstract), a virtual router (col.72, lines 14-30, a virtual subnet (col.39, lines 3-14), and the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing (col.39, lines 16-34 and col.72, lines 14-41)

The cited sections read as follows:

> A virtual LAN system forms a virtual group which is based on elements having physical attribute or logical attribute and constituting a virtual LAN, sets a client address and priority of the virtual group in a virtual group registration table, and allocates unicast and broadcast traffic bands in group units.

(Abstract)

When the intranet routing/bridge protocol processing section 470 of the intranet router 459 prepares a routing table containing learning filtering 471A, 471B of layer 402 and 403 addresses, the table is cached in the virtual group routing table (cut-through table) 485 of the virtual group distributed management sections 488, input packet is cut through, and the intranet routing/bridge protocol processing section 470 is bypassed. The intranet routing/bridge protocol processing section 470 converts into a LAN packet by LAN emulation from ATM in conformity with the ATM forum standard and performs virtual router processing by MPOA of upper layer. In addition to the filtering 471A, 471B, the intranet routing/bridge protocol processing section 470 contains LAN emulation 474, IP connection (RFC1577) MPOA 475, and route calculation 476 so as to be able to handle standard protocols such as 1-PNN1 and IP connection (RFC1577).

VLAN as a local intranet segment and a global internet segment are separated, routing of VLAN as an intranet segment is processed in the intranet routing table of the distributed network service equipment 411 close to a desktop, packets are filtered so that only internet segment traffic is sent to the ports to which the main router is connected, and the main router of the WAN connection unit 455 of the integrated network service equipment 451 processes routing connected to the internet or LAN in the internet routing table.

(Column 72, lines 14-41)

As described above, a virtual subnet configuration wherein management of the virtual group registration/routing table (intranet routing table) does not concentrate on the main router 201 can also be realized in multilayer switching with layer 202 (data link layer) and layer 203 (network layer); multicast is efficiently processed for shortening the delay time and multiports are supported. Virtual groups (VLANs) independent of internet protocol subnets can be formed and VLAN routing can be processed by the local router switch 202 and the local switches 203a . . . separately from internet routing.

(Column 39, lines 3-14)

In a tenth embodiment of the invention, virtual group IDs and subnet IDs can be set in virtual group registration/routing tables in virtual group registration/routing table sections 214a . . . of local switches 203a . . . in the same configuration as the ninth embodiment. (See FIG. 20.) Only when the destination virtual group ID of a transmission packet does not match any virtual group ID of local site VLANs registered in the virtual group registration/routing table, an intranet processing section 209 of a local router switch 202 encapsulates the destination virtual group ID in an internet protocol packet with the destination subnet ID and forwards and the resultant packet to a main router 201. If the destination client address differs from the virtual group ID of the source client address and the destination subnet ID matches the local site subnet ID, the local

router switch 202 unicasts or multicasts the packet to the port corresponding to the destination client address.

(Column 39, lines 16-34)

While in these sections, Yuasa may describe the implementation of virtual network devices, the virtual network devices are not virtualized **on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices. The virtual router is not at least one router virtualized **on the same single multi-function chip** by means of a combination of hardware and software to form a virtual router. Additionally, in contradiction to the Examiner's allegation that Yuasa teaches control-flow processing, nowhere in Yuasa is control-flow processing even mentioned. Thus, Yuasa fails to teach or suggest a **virtual router** that has functions of destination lookup and packet forwarding, which are incurred only on **control-flow processing**.

Furthermore, there is not so much as a suggestion in either reference to modify the references to include such features. That is, there is no teaching or suggestion in Pettey or Yuasa that a problem exists for which virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices, virtualizing at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing, and wherein the virtual network devices and virtual router form a virtual subnet, is a solution. To the contrary, Pettey only teaches the connection of physical devices through an Infiniband fabric. Yuasa merely teaches virtual network devices. Neither reference even recognizes a need to virtualize a plurality of network devices and router **on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices and a virtual router, where the virtual router performs control-flow processing for the virtual network devices and where the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing, and wherein the virtual network devices and virtual router form a virtual subnet, as recited in claim 1.

Moreover, neither reference teaches or suggests the desirability of incorporating the subject matter of the other reference. That is, there is no motivation offered in either reference for the alleged combination. The Examiner alleges that the motivation for the combination is "Yuasa's teachings would have provided capability for enabling highs peed (sic) routing for the intranet." Neither reference teaches virtual network devices or virtual routers on a single multifunction chip, or control-flow processing. Thus, the only motivation to even attempt the alleged combination would be based on a prior knowledge of Appellants' claimed invention, thereby constituting impermissible hindsight reconstruction using Appellants' own disclosure as a guide.

One of ordinary skill in the art, being presented only with Pettey and Yuasa, and without having a prior knowledge of Appellants' claimed invention, would not have found it obvious to combine and modify Pettey and Yuasa to arrive at Appellants' claimed invention. To the contrary, even if one of ordinary skill in the art were somehow motivated to combine Pettey and Yuasa, and it were somehow possible to combine the two systems, the result would not be the invention, recited in claim 1. The result would be a network of physical devices and routers connected through an Infiniband fabric that receives IP packets using a mapping table. The resulting system still would not virtualize a plurality of network devices **on a single multi-function chip** by means of a combination of hardware and software to form virtual network devices and virtualize at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing, and wherein the virtual network devices and virtual router form a virtual subnet.

Thus, Pettey and Yuasa, taken alone or in combination, fail to teach or suggest all of the features in independent claims 1, 11, and 19. At least by virtue of their dependency on claims 1, 11, and 19, the specific features of claims 2-10 and 12-18 are not taught or suggested by Pettey and Yuasa, either alone or in combination. Accordingly, Appellants respectfully request that the rejection of claims 1-19 under 35 U.S.C. § 103(a) not be sustained.

CONCLUSION

In view of the above, Appellants respectfully submit that claims 1-19 are allowable over the cited prior art and that the application is in condition for allowance. Accordingly, Appellants respectfully request the Board of Patent Appeals and Interferences to not sustain the rejections set forth in the Final Office Action.

Francis Lammes

Francis Lammes
Reg. No. 55,353
YEE & ASSOCIATES, P.C.
PO Box 802333
Dallas, TX 75380
(972) 385-8777

CLAIMS APPENDIX

The text of the claims involved in the appeal are:

1. A method for partitioning a computer network end node, the method comprising:

virtualizing a plurality of network devices on a single multi-function chip by means of a combination of hardware and software to form virtual network devices; and

virtualizing at least one router on the single multi-function chip by means of a combination of hardware and software to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices, and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing;

wherein the virtual network devices and the virtual router form a virtual subnet.

2. The method according to claim 1, wherein the virtual network devices are host channel adapters.

3. The method according to claim 1, wherein the virtual network devices are target channel adapters.

4. The method according to claim 1, further comprising assigning unique identifiers to the virtual network devices.

5. The method according to claim 1, further comprising virtualizing a plurality of subnets on the single multi-function chip by means of software.

6. The method according to claim 1, further comprising registering the virtual subnet with a physical subnet.

7. The method according to claim 6, wherein the physical subnet perceives the single multi-function chip as only a single router with multiple Host Channel Adapters residing behind [[it]] the single router.

8. The method according to claim 6, wherein nodes in the physical subnet communicate with the virtual subnet through the virtual router.

9. The method according to claim 1, wherein the single multi-function chip provides resource configuration and allocation interface that allow software, firmware and hardware state machines to set an operating policy for the virtual network devices.

10. The method according to claim 1, wherein the single multi-function chip provides standard device functions directly to the virtual network devices by means of physical queue pairs even though those devices logically reside behind a virtual router.

11. A computer program product in a tangible computer readable medium for use in a data processing system, for partitioning a computer network end node, the computer program product comprising:

instructions virtualizing a plurality of network devices on a single multi-function chip to form virtual network devices; and

instructions for virtualizing at least one router on the single multi-function chip to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices, and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing;

wherein the virtual network devices and the virtual router form a virtual subnet.

12. The computer program product according to claim 11, wherein the virtual network devices are host channel adapters.

13. The computer program product according to claim 11, wherein the virtual network devices are target channel adapters.

14. The computer program product according to claim 11, further comprising instructions for assigning unique identifiers to the virtual network devices.

15. The computer program product according to claim 11, further comprising instructions for virtualizing a plurality of subnets on the single multi-function chip by means of software.

16. The computer program product according to claim 11, further comprising instructions for registering the virtual subnet with a physical subnet.

17. The computer program product according to claim 16, wherein the physical subnet perceives the single multi-function chip as only a single router with multiple Host Channel Adapters residing behind the single router.

18. The computer program product according to claim 16, wherein nodes in the physical subnet communicate with the virtual subnet through the virtual router.

19. A system for partitioning a computer network end node, the system comprising:

a first virtualizing component which virtualizes a plurality of network devices on a single multi-function chip to form virtual network devices; and

a second virtualizing component which virtualizes at least one router on the single multi-function chip to form a virtual router, wherein the virtual router performs control-flow processing for the virtual network devices, and wherein the virtual router functions of destination lookup and packet forwarding are incurred only on control-flow processing;

wherein the virtual network devices and the virtual router form a virtual subnet.

EVIDENCE APPENDIX

There is no evidence to be presented.

RELATED PROCEEDINGS APPENDIX

Therc are no related proceedings.